

## **REMARKS**

Claims 1-20 are pending in the application.

### **I. TRAVERSE OF THE ANTICIPATION REJECTION**

The Examiner rejected claims 1, 10 and 20 under 35 USC 102(b) as being anticipated by Margerum (US4,481,519). To sustain an anticipation rejection, the examiner must show that all of the rejected claim features are present in a single reference. If one or more claim feature is not present, then the rejection under 35 USC 102 must be withdrawn. The examiner's anticipation rejection must be withdrawn because Margerum does not disclose all of the features of claims 1, 10 or 20. More specifically claims 1, 10 and 20 are novel because Margerum does not disclose:

- a measuring apparatus for determining the signal strength of individual antennas.
- a combining means for deriving combined antenna signal strengths by forming combinations of first and second antenna signals derived from different antennas.
- a means for determining the emitter bearing from the signal strengths.

Claims 1, 10 and 20 are novel because Margerum does not disclose a measuring apparatus for determining the signal strength of individual antennas of claims 1, 10 and 20. The examiner refers to "switch 39" in Fig 1 of Margerum as satisfying this claim feature. However, switch 39 does not and cannot measure signal strength. Indeed, switch 39 routes signals along or from different paths. Therefore independent claims 1, 10 and 20 are novel at least because Margerum does not disclose this claim feature.

Claims 1, 10 and 20 also include a "combining means for deriving combined antenna signal strengths by forming combinations of first and second antenna signals derived from different antennas" that is also not disclosed in Margerum. The examiner refers to the pairs of antennas and phase detector 60 of Margerum as disclosing this feature. The Margerum phase detector 60 does have two inputs and a single output, but it does not combine the signals for deriving the combined antenna signal strengths as claimed in claim 1. Instead, phase detector 60 provides an output dependent upon the relative phase of the signals. This understanding of the purpose and operation of phase detector 60 finds support in Margerum at column 4, lines 55-58, where it states "the output of phase detector 60 is a voltage representative of the phase

difference between the radio frequency signals received by the pair of antennas 13, 14." Because the output of Margerum phase detector 60 is unrelated to the signal strengths, as required by above-cited independent claim passage, this feature is not present in Margerum and claims 1, 10 and 20 are, therefore, novel.

Independent claims 1, 10 and 20 also include a "means for determining the emitter bearing from the signal strengths". The examiner relies on the Margerum phase detector 60, the digital converter and the computer for disclosing this claim feature. However, these features do not use the signal strengths. Instead, phase detector 60 provides an output based upon phase, not amplitude, to the computer. Again, claims 1, 10 and 20 are novel because this feature is not present in Margerum.

## **II. TRAVERSE OF THE OBVIOUSNESS REJECTIONS**

The Examiner rejected claims 1, 3-8, 10, 12-17 and 20 under 35 USC 103(a) as being unpatentable over Margerum in view of Harris (US2831187). It is the examiner's position that if Margerum does not disclose a signal strength indicator for an individual antenna then Harris does. The examiner supports the combination of references by asserting that it would have been obvious to modify Margerum to include means for determining individual antenna signal strength in order to efficiently provide a system by which the presence of short-wave radio signals from all azimuths can be detected and bearings determined. The examiner's obviousness rejection cannot be sustained at least because: (1) the combination of references do not disclose all claim features; (2) the combination would result in an inoperable device; and (3) because one skilled in the art at the time of the invention would not have combined the references as the examiner has.

### **A. Margerum And Harris Do Not Disclose All Claim Features**

Claims 1, 3-8, 10, 12-17 and 20 are non-obvious and patentable at least because the combination of Margerum and Harris does not disclose or suggest all of the features of independent claims 1, 10 and 20. In particular, independent claims 1, 10 and 20 are non-obvious and patentable because neither Harris nor Margerum discloses or suggests the combining means for deriving combined signal strengths of claims 1, 10 and 20. Therefore any combination of Harris and Margerum cannot result in the invention as claimed.

Claims 1, 3-8, 10, 12-17 and 20 are also non-obvious and patentable because neither Harris nor Margerum discloses determining the signal strength of more than one antenna of claims 1, 10 and 20. The examiner states that Harris discloses a signal strength indicator for an individual antenna. The examiner has not attempted to demonstrate that Harris discloses methods for determining combined antenna signal strengths as claimed. One skilled in the art, therefore, would have no motivation to add the Harris signal strength indicator for a single antenna to the teaching of Margerum, because Margerum uses a relative signal phase, which inevitably uses two signals. Thus, one skilled in the art would not consider using a signal strength indicator for a single signal in a device that uses two signals to measure relative signal phase and claims 1, 3-8, 10, 12-17 and 20 are non-obvious and patentable for this reason as well.

**B. The Combination of Margerum And Harris Would Be An Inoperable Device**

Claims 1, 3-8, 10, 12-17 and 20 are also non-obvious and patentable because the combination of Margerum and Harris would be inoperable. No suggestion is made in Margerum that amplitude may be substituted for phase. The entire Margerum disclosure is so firmly rooted in the detection and measurement of phase that one reading it would not consider altering the Margerum invention therein to work using amplitude instead of phase. Moreover, if one were to replace the Margerum phase detector 60 with an amplitude detector, then the subsequent device would not function to provide a bearing or direction. Instead, the processing would be working on effectively meaningless data. Thus a substitution of the Margerum phase dependent components for Harris amplitude dependent components would not work as claimed and claims 1, 3-8, 10, 12-17 and 20 are, therefore, non-obvious and patentable.

**C. One Skilled In The Art Would Not Combine Margerum And Harris**

Claims 1, 3-8, 10, 12-17 and 20 are also non-obvious and patentable because one skilled in the art would not combine Harris with Margerum. Instead, one skilled in the art would consider Margerum an advance over Harris and would not view the two references as producing any useful combinable invention. Harris relies for its direction finding on rotating the antenna array to provide a bearing. A skilled person would not be tempted to use such primitive methods in combination with the teaching of Margerum to implement a direction finding system. The system of Margerum is more complex, and is designed to supersede the primitive antenna rotating techniques of Harris to provide a more convenient and efficient direction finder. Thus, claims 1, 3-8, 10, 12-17 and 20 are non-obvious and patentable because one skilled in the art

would not have combined Margerum and Harris as the examiner has.

### **III. THE REMAINING OBVIOUSNESS REJECTIONS**

The examiner also rejected claims 2 and 11 for being obvious over Margerum in view of Kuwahara (USP 6,278,406); claims 8 and 17 for being obvious over Margerum in view of Gahose (USP 4,486,757); and claims 9 and 18-19 for being obvious over Margerum in view of Rose (USP 5,574,468). The rejected claims are non-obvious and patentable at least because Margerum alone or in combination with the cited secondary references do not disclose the claim features discussed in Section I above and because independent claims 1, 10 and 20 – the claims upon which the rejected claims depend - are non-obvious and patentable for the reasons recited in Section II above.

### **CONCLUSION**

Pending application claims 1-20 are believed to be non-obvious and patentable for the reasons recited above. Favorable reconsideration and allowance of all pending application claims is, therefore, courteously solicited.

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